Former Sydney Fish Markets Demolition

Construction Noise and Vibration Impact Assessment

Infrastructure NSW

Prepared by:
SLR Consulting Australia

SLR Project No.: 610.032502.00001

22 May 2026

Revision: 1.0

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
1.0	22 May 2026	Adam Sirianni	Tom Candalepas	Tom Candalepas

Basis of Report

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1.0 Introduction

This report supports a Review of Environmental Factors (REF) under Part 5 of the Environmental Planning and Assessment Act 1979 for the demolition of the existing buildings and structures at the former Sydney Fish Markets (the site).

SLR is suitably qualified to produce this noise and vibration impact assessment. SLR staff are members of the Australian Acoustical Society (AAS) and SLR is a member firm of the Association of Australasian Acoustical Consultants (AAAC).

This report summarises the assessment of the potential construction impacts associated with the proposal.

The following report uses specialist acoustic terminology. An explanation of common terms is provided in **Appendix A**.

1.1 Proposal Description

The former Sydney Fish Market closed to the public in early 2026 when operations relocated to the new Sydney Fish Market facility at the head of Blackwattle Bay. The former Sydney Fish Market buildings and structures have since been decommissioned and reached the end of their useful life. Infrastructure NSW therefore needs to proceed with demolition of the buildings as a matter of priority. Demolition of the former Sydney Fish Market buildings support the NSW Government's long-term plan to renew Blackwattle Bay with new public open space, improved waterfront access and a mix of housing, community, and commercial uses.

The proposed works include:

- Demolition of existing buildings at the former Sydney Fish Market to slab level including:
    - Building A, Building B, Building C, Building D two separate buildings located north of Building D (previously occupied by Claudio's Seafood and Musumeci Seafood) and ancillary structures including kiosks, containers and security offices.
- Demolition of suspended floors, blockwork, and other structural elements above the ground floor slab level.
- Site clearing and establishment works, including installation of temporary site hoarding, scaffolding, and temporary facilities and amenities associated with the demolition works.
- Site infrastructure works including capping all redundant services back to the site perimeter.
    - The former fish market building is proposed to be demolished from north to south, with the southern façade of the building remaining in place during the main site demolition works.

Aerial plans indicating the site layout, defined Noise Catchment Areas (NCA), noise monitoring and receiver assessment locations are depicted in **Figure 1**

The demolition plan for the proposal is shown in **Figure 2**.

Figure 1 Site Location, Surrounding Receivers and Noise Monitoring Locations

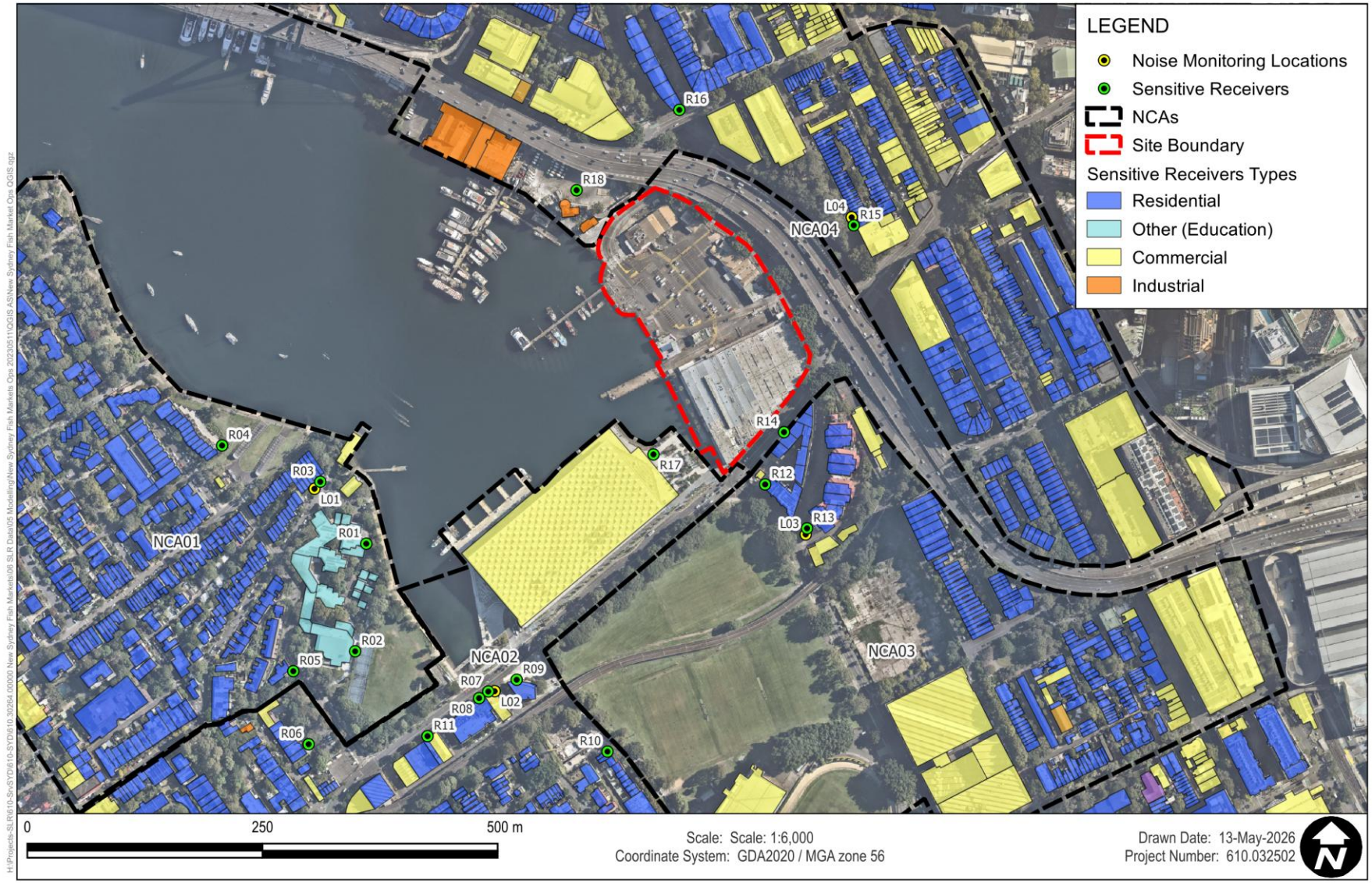
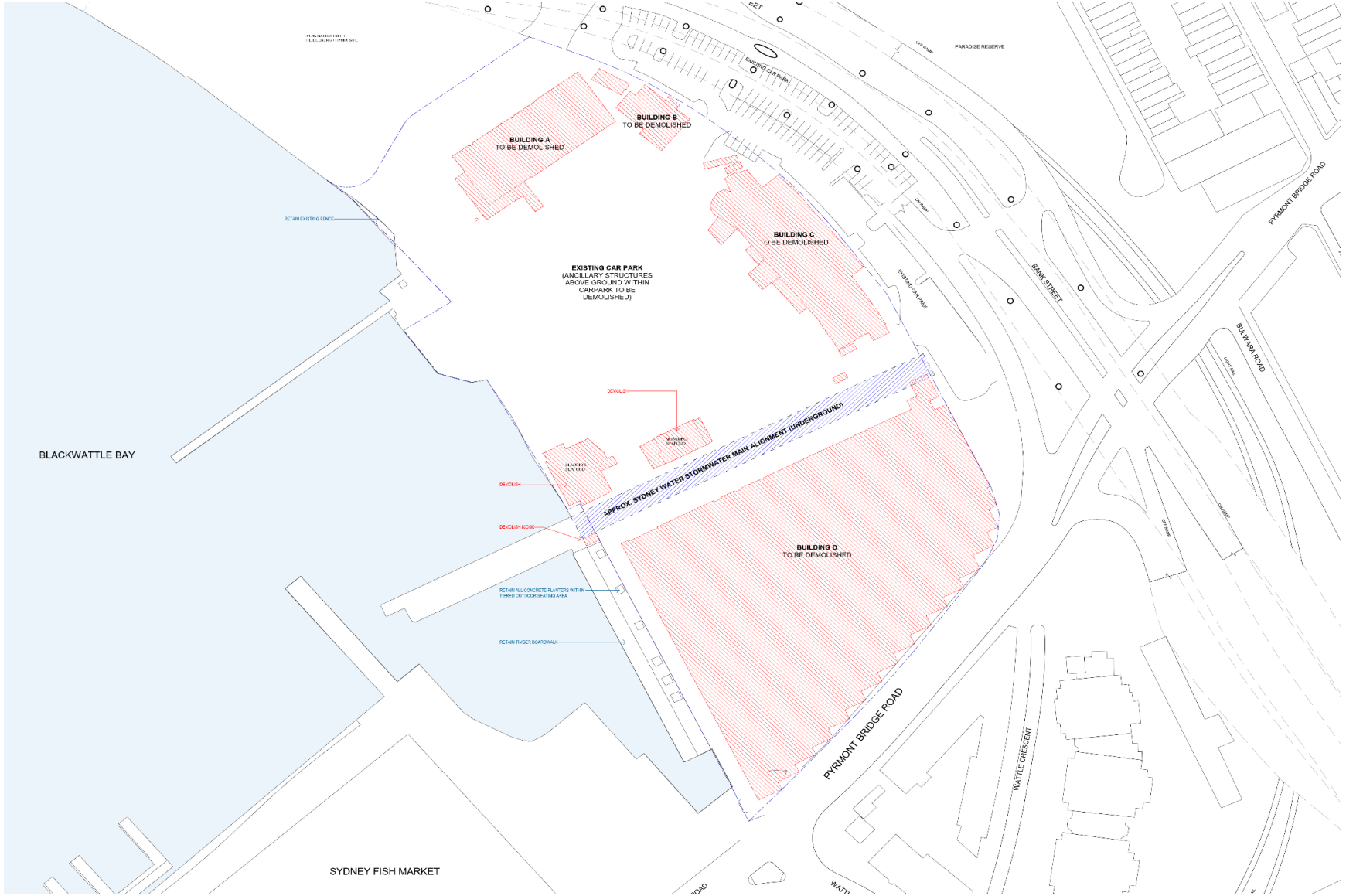


Figure 2 Demolition Plan



1.1.1 Purpose of this Report

SLR Consulting Australia Pty Ltd (SLR) has been engaged by Infrastructure NSW to perform a noise and vibration assessment of the potential impacts resulting from the demolition of the existing buildings and structures at the former Sydney Fish Markets.

Noise levels have been predicted to the nearest noise sensitive receivers surrounding the project site to assess potential impacts from activities associated with demolition works. This report also provides recommended management measures to mitigate the potential construction noise and vibration impacts arising from the proposed demolition works.

1.1.2 Relevant Documents

The following standards, guidelines, drawings and relevant documents have been used to establish the project specific acoustic design requirements for the development:

- NSW EPA's Noise Policy for Industry, dated October 2017 (NPfI).
- NSW EPA's Interim Construction Noise Guideline, dated July 2009 (ICNG).
- Transport for NSW's Construction Noise and Vibration Guideline – Public Transport Infrastructure 2023, dated September 2023 (CNVG-PTI).
- NSW Department of Environment and Conservation – Assessing Vibration: A Technical Guideline, dated February 2006 (AVTG).
- BS 7385.2:1993 Evaluation and Measurement for Vibration in Buildings Part 2: Guide to Damage Levels from Ground-borne Vibration (BS 7385.2).
- DIN 4150 Part 3-2016: Vibrations in buildings – Part3: Effects on structures (DIN 4150).

1.1.3 Nearest Receivers

The surrounding environment comprises Blackwattle Bay to the north; residential apartments to the South East; New Sydney Fish Market, Wentworth Park and residential dwellings to the South; Sydney Secondary College to the West and residential dwellings with frontage to Blackwattle Bay to the North West. The site is in close proximity to the Anzac Bridge and the Western Distributor.

The sensitive receivers identified in the vicinity of the Project are shown in **Figure 1** and are representative of other nearby receivers. A number of Noise Catchment Areas (NCAs) that reflect the changing land use around the project site have been defined and are also shown in the figure. Details regarding the nearest receivers are provided in **Table 1**.

Table 1 NCAs and Sensitive Receivers

ID	NCA	Property Type	Address
R01	NCA01	Education	Sydney Secondary College Blackwattle Bay Taylor St, Glebe
R02	NCA01	Education	Sydney Secondary College Blackwattle Bay Taylor St, Glebe
R03	NCA01	Residential	115 Ferry Rd, Glebe
R04	NCA01	Residential	Shore Terraces 3 Griffin Pl, Glebe
R05	NCA01	Residential	13/40 Ferry Rd, Glebe
R06	NCA02	Residential	3 Burton Street, Glebe
R07	NCA02	Commercial	Kauri Foreshore Hotel 2 Bridge Rd, Glebe
R08	NCA02	Residential	4-8 Bridge Rd, Glebe
R09	NCA02	Residential	84-86 Wentworth Park Rd, Glebe
R10	NCA02	Residential	78 Wentworth Park Rd, Glebe
R11	NCA02	Commercial	14-18 Bridge Rd, Glebe
R12	NCA03	Residential	6-10 Wattle St, Pyrmont
R13	NCA03	Residential	46054 Wattle Crescent, Pyrmont
R14	NCA03	Residential	1 Wattle Crescent, Pyrmont
R15	NCA04	Residential	72 Bulwara Rd, Pyrmont
R16	NCA02	Residential	17 Jones St, Pyrmont
R17	NCA02	Commercial	New Sydney Fish Market
R18	NCA03	Industrial	41-45 Bank St, Pyrmont

2.0 Existing Noise Environment

Previously completed noise monitoring at the site between 15 October and 27 October 2025 for the Blackwattle Bay public wharf at the new Sydney Fish Market has been used to establish existing noise levels representative of receivers potentially most affected by the proposal. The noise monitoring locations are shown in **Figure 1** and the results are summarised in **Table 2**.

Table 2 Summary of Unattended Noise Monitoring Results

ID	NCA	Address/Description	Measured Noise Levels (dBA)					
			Background Noise (RBL)			Average Noise (L_{Aeq})		
			Day	Evening	Night	Day	Evening	Night
L01	NCA01	113 Ferry Rd, Glebe	47	49	41	53	53	47
L02	NCA02	2 Bridge Rd, Glebe	54	53	43	64	63	57
L03	NCA03	6-10 Wattle St, Pyrmont	54	53	45	66	64	61
L04	NCA04	82 Bulwara Rd, Pyrmont	57	57	49	63	65	58

Note 1: The assessment periods are the daytime which is 7 am to 6 pm Monday to Saturday and 8 am to 6 pm on Sundays and public holidays, the evening which is 6 pm to 10 pm, and the night-time which is 10 pm to 7 am on Monday to Saturday and 10 pm to 8 am on Sunday and public holidays. See the NSW EPA Noise Policy for Industry.

3.0 Assessment Criteria

3.1 Construction Noise Criteria

3.1.1 NSW Interim Construction Noise Guideline

The NSW *Interim Construction Noise Guideline* (ICNG) is used to assess and manage impacts from construction noise on residences and other sensitive land uses in NSW.

The ICNG contains procedures for determining project specific Noise Management Levels (NMLs) for sensitive receivers based on the existing background noise in the area. The 'worst-case' noise levels from construction of a proposal are predicted and then compared to the NMLs in a 15-minute assessment period to determine the likely impact of the proposal.

The NMLs are not mandatory limits, however, where construction noise levels are predicted or measured to be above the NMLs, feasible and reasonable work practices to minimise noise emissions are to be investigated.

Residential Receivers

The ICNG approach for determining NMLs at residential receivers is shown in **Table 3**.

Table 3 ICNG NMLs for Residential Receivers

Time of Day	NML $L_{Aeq(15minute)}$	How to Apply
Standard Construction Hours Monday to Friday 7:00 am to 6:00 pm Saturday 8:00 am to 1:00 pm No work on Sundays or public holidays	Noise affected RBL[1] + 10 dB	• The noise affected level represents the point above which there may be some community reaction to noise • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly Noise Affected 75 dBA	• The Highly Noise Affected (HNA) level represents the point above which there may be strong community reaction to noise • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restructuring the hours that the very noisy activities can occur, taking into account: o Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences o If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside Standard Construction Hours[2]:	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours • The proponent should apply all feasible and reasonable work practices to meet the noise affected level • Where all feasible and reasonable practises have been applied and noise is more than 5 dB above the noise affected level, the proponent should negotiate with the community.

Note 1: The RBL is the Rating Background Level and the ICNG refers to the calculation procedures in the NSW Industrial Noise Policy (INP). The INP has been superseded by the NSW EPA Noise Policy for Industry (NPfI).

Note 2: ICNG treats all hours outside of standard hours equally. The CNVG-PTI provides a more nuanced breakdown of this period which has been included to maintain continuity between the guidelines.

The construction NMLs for the proposal have been determined for residential receivers during standard hours and out of hours works as per **Table 5**.

'Other Sensitive' Land Uses and Commercial Receivers

The ICNG NMLs for 'other sensitive' non-residential land uses are shown in **Table 4**.

The ICNG references *AS2107:2016 Acoustics – Recommended design sound levels and reverberation times for building interiors* for criteria for 'other sensitive' receivers which are not listed in the guideline.

Table 4 NMLs for 'Other Sensitive' Receivers

Land Use	Noise Management Level $L_{Aeq(15minute)}$ (dBA) (Applied when the property is in use)	
	Internal	External
ICNG 'Other Sensitive' Receivers		
Classrooms at schools and other educational institutions	45	55[1]
Commercial	-	70
Industrial	-	70

Note 1: It is assumed that these receivers have windows partially open for ventilation which results in internal noise levels being around 10 dB lower than the external noise level.

3.1.1.1 NML Summary

The construction NMLs are summarised in **Table 5**.

Table 5 Construction Noise Management Levels

NCA	Receiver Type	Monitoring Location	NML ($L_{Aeq(15minute)}$ (dBA))				Sleep Disturbance Screening Level[2] (LAmax dBA)
			Standard Daytime (RBL+10dB)	Out of Hours (RBL+5dB)			
				Daytime[1]	Evening	Night	Night
NCA01	Residential	L01	57	52	54	46	56
NCA02	Residential	L02	64	59	58	48	58
NCA03	Residential	L03	64	59	58	50	60
NCA04	Residential	L04	67	65	62	54	64
NCA01	Educational	n/a	55 (external noise level, when in use)				n/a
All	Commercial	n/a	70 (when in use)				n/a
All	Industrial	n/a	75 (when in use)				n/a

Note 1: Daytime out of hours is 7am to 8am and 1pm to 6pm on Saturday, and 8am to 6pm on Sunday and public holidays.
Note 2: Sleep disturbance screening level is RBL+15 dB or 52 dBA, whichever is higher.

Highly Noise Affected

In addition to the NMLs presented above, the ICNG highly noise affected level (>75 dBA) represents the point above which there may be strong community reaction to noise and is applicable to all residential receivers during approved project hours as outlined in the ICNG.

Sleep Disturbance

Infrastructure projects often require certain work to be completed during the night-time. Where night work is located close to residential receivers, there is potential for sleep disturbance impacts.

The ICNG lists five categories of work that might need to be undertaken outside of Standard Construction Hours:

- the **delivery of oversized equipment or structures** that require special arrangements to transport on public roads

- **emergency work** to avoid the loss of life or damage to property, or to prevent environmental harm
- **maintenance and repair of public infrastructure** where disruption to essential services or considerations of worker safety do not allow work within standard hours
- **public infrastructure work** that shortens the length of the project and is supported by the affected community
- work where a proponent demonstrates and justifies **a need to operate outside the recommended standard hours**.

Where construction work is planned to extend over more than two consecutive nights, the ICNG recommends that an assessment of sleep disturbance impacts should be completed. The ICNG refers to the *NSW Environmental Criteria for Road Traffic Noise* for assessing the potential impacts, which notes that to limit the level of sleep disturbance, the L_1 level (or L_{Amax}) should not exceed the existing L90 background noise level by more than 15 dB.

3.1.2 Construction Traffic Noise Guidelines

The potential impacts from construction traffic associated with the Proposal when travelling on public roads are assessed under the NSW EPA Road Noise Policy (RNP).

An initial screening test is first applied to evaluate if existing road traffic noise levels are expected to increase by more than 2.0 dB as a result of construction traffic. Where this is considered likely, further assessment is required using the RNP criteria shown in **Table 6**.

Table 6 RNP Criteria for Assessing Construction Traffic on Public Roads

Road Category	Type of Project/Land Use	Assessment Criteria (dBA)	
		Daytime (7 am – 10 pm)	Night-time (10 pm – 7 am)
Freeway/ arterial/ sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq(15hour)}$ 60 (external)	$L_{Aeq(9hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq(1hour)}$ 55 (external)	$L_{Aeq(1hour)}$ 50 (external)

3.2 Construction Vibration Criteria

The effects of vibration from construction works can be divided into three categories:

- Those in which the occupants of buildings are disturbed (human comfort)
- Those where building contents may be affected (building contents)
- Those where the integrity of the building may be compromised (structural or cosmetic damage).

3.2.1 Human Comfort Vibration

People can sometimes perceive vibration impacts when vibration generating construction works are located close to occupied buildings.

Vibration from construction works tends to be intermittent in nature and the EPA's *Assessing Vibration: a technical guideline* (2006) provides criteria for intermittent vibration based on the

Vibration Dose Value (VDV). The 'preferred' and 'maximum' VDVs for human comfort impacts are shown in **Table 7**.

Table 7 Vibration Dose Values for Intermittent Vibration

Building Type	Assessment Period	Vibration Dose Value[1] ($m/s^{1.75}$)	
		Preferred	Maximum
Critical Working Areas (eg operating theatres or laboratories)	Day or night-time	0.10	0.20
Residential	Daytime	0.20	0.40
	Night-time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night-time	0.40	0.80
Workshops	Day or night-time	0.80	1.60

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

3.2.2 Effects on Building Contents

People perceive vibration at levels well below those likely to cause damage to building contents. For most receivers, the human comfort vibration criteria are the most stringent and it is generally not necessary to set separate criteria for vibration effects on typical building contents.

Exceptions to this can occur when vibration sensitive equipment, such as electron microscopes, are located in buildings near to construction works. No such items of equipment have been identified in the project area.

3.2.3 Structural and Cosmetic Damage Vibration

If vibration from construction works is sufficiently high, it can cause damage to structural elements of affected buildings. The levels of vibration required to cause cosmetic damage tend to be at least an order of magnitude (10 times) higher than those at which people can perceive vibration.

Examples of damage that can occur includes cracks or loosening of drywall surfaces, cracks in supporting columns and loosening of joints. Structural damage vibration limits are contained in British Standard BS 7385 and German Standard DIN 4150.

BS 7385

British Standard BS 7385 recommends vibration limits for transient vibration judged to give a minimal risk of vibration induced damage to affected buildings. The limits for residential and industrial buildings are shown in **Table 8**.

Table 8 BS 7385 Transient Vibration Values for Minimal Risk of Damage

Group	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures. Industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures. Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Note 1: Where the dynamic loading caused by continuous vibration may give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values may need to be reduced by up to 50%.

For heritage buildings, the standard states that "a building of historical value should not (unless it is structurally unsound) be assumed to be more sensitive".

DIN 4150

For buildings or structures of historical significance or a heritage nature, the vibration limits need to be revised due to their sensitive nature. As BS 7385.2 does not refer to buildings or structures of a sensitive nature, the more appropriate DIN 4150.3 is proposed.

For continuous long-term vibration or repetitive vibration with the potential to cause fatigue effects, DIN 4150 provides the following Peak Particle Velocity (PPV) values as safe limits, below which even superficial cosmetic damage is not to be expected:

- 2.5 mm/s for buildings of great intrinsic value (eg. heritage listed structures).

General Vibration Screening Criteria Summary

The Transport for NSW Construction Noise and Vibration Strategy (CNVS) specifies general vibration screening criteria based on BS 7385. It notes that for most construction activities involving intermittent vibration such as rock breakers, piling rigs, vibratory rollers, excavators and the like, vibration predominantly occurs at frequencies greater than 4 Hz and therefore specifies the following conservative vibration damage screening levels:

- Reinforced or heavy frame structures: 25 mm/s
- Unreinforced or light frame structures: 7.5 mm/s.
- buildings of great intrinsic value (eg. heritage listed structures): 2.5mm/s

At locations where the predicted and/or measured vibration levels are greater than shown above, a more detailed analysis of the building structure, vibration source, dominant frequency and dynamic characteristics of the structure would be required to determine the applicable safe vibration levels.

Heritage

Heritage structures are also assessed against the above screening criteria as they should not be assumed to be more sensitive to vibration unless they are found to be structurally unsound following an inspection. In this case a 2.5 mm/s criterion can be applied in accordance with DIN 4150. No such structures have been identified in the project area.

3.2.4 Buried Pipework and Utilities

Based on the demolition plan shown in **Figure 1**, it is understood that the demolition of the old Sydney Fish Market building is in close proximity to pre-existing concrete culverts. SLR have previously investigated vibration impacts from construction activities nearby culverts and have adopted guidance from BS 5228-2:2009 to establish the vibration criteria.

Where culverts may be in dilapidated or poor condition, BS 5228-2:2009 recommends the following:

> *"In the event of encountering elderly and dilapidated brickwork sewers, the base data should be reduced by 20% to 50%."*

Therefore, a 12mm/s criterion has been conservatively adopted for culverts in close proximity to the development.

As shown in **Figure 2**, a Sydney Water underground Stormwater main runs through the site, north of Building D. The asset type should be confirmed in the CNVMP to determine the asset type and applicable threshold value as per Table 6 of Sydney Water's *Specialist Engineering Assessment Version 1 dated 19 February 2021* and shown in **Table 9**.

Table 9 Sydney Water Asset Threshold Vibration Limits

Asset Type	Threshold values for velocity (PPV) measured on the asset in mm/s
Brittle Pipe assets – RC, VC/ EW, CICL	Maximum PPV for intermittent vibrations 10mm/s Maximum PPV for continuous vibrations 5mm/s
Ductile Pipe assets – SCL, DI, PVC, PE, PP, GRP	Maximum PPV for intermittent vibrations 20mm/s Maximum PPV for continuous vibrations 10mm/s
Masonry	3 mm/s
Unreinforced concrete	3 mm/s

Note: Applicable for buried assets, in sound condition, and laid in a typical soil trench in stable ground. Alternative criteria shall be developed for other asset types, above ground assets, concrete encased pipes, pipes on piled/ special supports and pipes in tunnels or of other unusual construction or ground conditions.

3.2.5 Minimum Working Distances for Vibration Intensive Work

Minimum working distances for typical vibration intensive construction equipment have been sourced from the Transport for NSW (TfNSW) Construction Noise and Vibration Guideline (Public Transport Infrastructure) (CNVG-PTI) and are shown in **Table 10**. The minimum working distances are for both cosmetic damage (from BS 7385 and DIN 4150) and human comfort (from the NSW EPA Assessing Vibration: a technical guideline). They are calculated from empirical data which suggests that where work is further from receivers than the quoted minimum distances then impacts are not considered likely.

The minimum working distances listed in the CNVG were used to derive the minimum working distances required for cosmetic damage to industrial and heavy commercial buildings (also reinforced or framed structures). The following pseudo-power law relationship has been used in the derivations:

$$V_2 = V_1 \times \left(\frac{D_1}{D_2}\right)^B$$

where a site exponent value of B = 1.6 is adopted for the calculations, as per AS2187.2:2006

Table 10 Recommended Minimum Working Distances from Vibration Intensive Equipment

Plant Item	Rating/Description	Minimum Distance		
		Cosmetic Damage		Human Response (NSW EPA Guideline)
		Residential and Light Commercial (BS 7385)	Industrial and Heavy Commercial (BS 7385)	
Vibratory Roller	<50 kN (1–2 tonne)	5 m	3 m	15 m to 20 m
	<100 kN (2–4 tonne)	6 m	3 m	20 m
	<200 kN (4–6 tonne)	12 m	6 m	40 m
	<300 kN (7–13 tonne)	15 m	8 m	100 m
	>300 kN (13–18 tonne)	20 m	10 m	100 m
	>300 kN (>18 tonne)	25 m	12 m	100 m
Small Hydraulic Hammer	300 kg (5 to 12 t excavator)	2 m	1 m	7 m
Medium Hydraulic Hammer	900 kg (12 to 18 t excavator)	7 m	4 m	23 m
Large Hydraulic Hammer	1,600 kg (18 to 34 t excavator)	22 m	11 m	73 m
Pile driver – vibratory	Sheet piles	2 m to 20 m	1 to 10 m	20 m
Piling Rig – bored	≤ 800 mm	2 m (nominal)	1 m	4 m
Piling rig – hammer	12t down force	15 m	8 m	50 m
Jackhammer	Hand held	1 m (nominal)	1 m	2 m

4.0 Methodology

4.1 Construction Noise and Vibration Assessment

A noise model of the study area has been used to predict noise levels from the proposed construction work to all surrounding receivers. The model uses ISO 9613-2024 algorithms in SoundPLAN v9.1 software.

Local terrain, receiver buildings and structures were digitised in the noise model to develop a three-dimensional representation of the construction sites and surrounding areas.

4.1.1 Hours of Work

The proposed hours of works, including the delivery of materials to and from the sites within the precinct, are as follows:

- Between 7:00 am and 6:00 pm, Mondays to Fridays inclusive.
- Between 8:00 am and 1:00 pm, Saturdays.
- No work will be carried outside these hours and on Sundays and Public Holidays.

Works outside these times are subject to agreement and approval by the relevant approving authority.

Works are anticipated to commence around the end of 2026 and continue for 7 months.

The hours of work outlined above are scheduled during standard construction hours only, therefore, no further assessment of out of hours works and sleep disturbance impacts have been undertaken in this assessment.

4.1.2 Construction Activities

Representative scenarios have been developed to assess the likely impacts from the various construction phases of the proposal outlined in **Section 1.1**. These scenarios are shown in **Table 11**. Site demolition works assessed in scenarios W.002 and W.003 include the demolition of all existing buildings occurring concurrently.

The assessment uses ‘realistic worst-case’ scenarios to determine the impacts from the noisiest 15-minute period that are likely to occur for each work scenario, as required by the ICNG. The impacts represent construction noise levels without mitigation applied.

The construction equipment used in each scenario and associated sound power levels is presented in **Appendix B**.

Table 11 Construction Work Scenarios

Scenario	Works Activity	Description	Total Lw
W.001	Site Establishment and Preparation Works	• Installation of hoarding and scaffolding • Establishment of temporary services and facilities • Internal hazmat removal	114
W.002	Site Demolition Works – Highly Noise Intensive	• Demolition of all existing buildings at the former Sydney Fish Market including highly noise intensive equipment	124
W.003	Site Demolition Works – Typical	• Demolition of all existing buildings at the former Sydney Fish Market excluding highly noise intensive equipment	117
W.004	Southern Wall Demolition – Highly Noise Intensive	• Demolition of the former fish markets southern wall including highly noise intensive equipment	120
W.005	Southern Wall Demolition – Typical	• Demolition of the former fish markets southern wall excluding highly noise intensive equipment	116
W.006	Site Clearing Works	• Clearing of rubbish, waste, rubble and removal of scaffolding and hoarding.	112

5.0 Assessment of Impacts

5.1 Construction Noise

5.1.1 Predicted Construction Noise Levels

The predictions are representative of the highest noise levels that could potentially be experienced at the surrounding receivers when the works are at the closest point. For most construction activities, it is expected that the construction noise levels would frequently be lower than those predicted, as the noise levels presented are based on all items of equipment in each scenario being used concurrently and occurring at the nearest point of the site to each receiver.

Noise contours of each construction scenario have been developed and is included in **Appendix C**.

The assessment shows the predicted impacts based on the exceedance of the NMLs, as per the categories in **Table 12** which have been adopted from the classifications stipulated in the TfNSW CNVG-PTI.

Table 12 Exceedance Bands and Impact Colouring

Subjective Classification	Exceedance of Noise Management Level	Impact Colouring
	Standard Daytime	
Negligible	No exceedance	
Clearly audible	1 to 10	
Moderately intrusive	11 to 20	
Highly intrusive	>20	
Highly Noise Affected[1]	-	**Bold**

Note 1: Only applicable to residential receivers.

The assessment uses ‘realistic worst-case’ scenarios to determine the impacts from the noisiest 15-minute period that are likely to occur for each work scenario, as required by the ICNG. The impacts represent construction noise levels without mitigation applied.

The predicted construction noise levels from the development have been assessed at the most-affected sensitive receivers surrounding the site during standard construction hours and out of hours works in **Table 13**.

Table 13 Predicted Construction Noise Levels at Nearest Sensitive Receivers – Standard Daytime Construction Hours

ID	NCA	Receiver Type	NML	Predicted Noise Level – LAeq(15minute) (dBA)					
				W.001	W.002	W.003	W.004	W.005	W.006
R01	NCA01	Education	55	58	65	58	63	59	56
R02	NCA01	Education	55	54	60	53	58	54	51
R03	NCA01	Residential	57	57	64	57	61	57	55
R04	NCA01	Residential	57	55	62	55	59	55	52
R05	NCA01	Residential	57	54	61	54	58	54	52
R06	NCA02	Residential	64	52	59	52	57	53	50
R07	NCA02	Commercial	70	56	62	55	61	57	54
R08	NCA02	Residential	64	55	61	54	59	55	52
R09	NCA02	Residential	64	56	62	55	60	56	53
R10	NCA02	Residential	64	56	62	55	59	55	52
R11	NCA02	Commercial	70	54	61	54	59	55	52
R12	NCA03	Residential	64	66	73	66	**76**	72	68
R13	NCA03	Residential	64	64	71	64	73	59	66
R14	NCA03	Residential	64	69	**76**	69	**82**	**78**	74
R15	NCA04	Residential	67	62	70	63	66	62	59
R16	NCA04	Residential	67	67	72	65	64	60	64
R17	NCA02	Commercial	70	75	81	74	80	76	73
R18	NCA03	Industrial	75	69	74	67	65	61	67

The above worst-case predictions during standard hours show the following:

- Noise impacts from the work are predicted to exceed the management levels during certain construction activities. The impacts are predicted to be the highest where work is required near to adjacent sensitive receivers and/or when noise intensive equipment is required.
- The closest residential receivers to the south of the site (R14) are predicted to experience highly noise affected levels (75 dBA or greater) during highly noise intensive site demolition works and demolition works of the former fish markets southern façade (*W.002, W.004* and *W.005*). Other nearby receivers (R12) are also predicted to experience highly noise affected levels (75 dBA or greater) during highly noise intensive demolition works of the former fish markets southern façade (*W.004)*
- 'Clearly audible' impacts are predicted to occur at the nearest residential receivers in NCA03 for all construction activities.
    - 'Moderately intrusive' impacts are predicted to occur at the closest receivers the works (R12 and R14) in *W.004* during highly noise intensive demolition works of the former fish markets southern façade.
    - 'Moderately intrusive' impacts are predicted to occur at and R14 during highly noise intensive site demolition works (*W.002*) and during typical demolition works of the former fish markets southern façade (*W.005*).
- 'Clearly audible' impacts are predicted to occur at the nearest residential receivers in NCA01 and NCA04 during highly noise intensive site demolition works (*W.002*).
    - These impacts are also predicted for the nearest residential receivers in NCA01 during highly noise intensive demolition works of the former fish markets southern façade (*W.004*).
- The closest residential receivers to the south of the site in NCA03 are predicted to experience 'clearly audible' impacts during site establishment and site clearing works (*W.001* and *W.006* respectively).
- 'Clearly audible' impacts are predicted to occur at educational receivers in NCA01 to the west of the site during all construction activities.
- 'Moderately intrusive' impacts are predicted to occur at the New Sydney Fish Market during highly noise intensive site demolition works (*W.002*). 'Clearly audible' impacts are predicted to occur during all other construction activities.
    - Other nearby 'other sensitive' receivers are predicted to comply with the NMLs during all construction activities.

The presented worst-case impacts would only be expected to occur where equipment operate at the conservatively assumed sound power level. Where works utilise less noise intensive equipment or the equipment operating times are reduced, the noise levels are also expected to reduce.

Additionally, the modelled noise levels assume the plant operates at the closest location to each receiver. For receivers that are closest to the work area, the actual noise levels would be notably lower than what has been predicted when plant equipment is operating at the centre or opposite end of the work site.

Feasible and reasonable construction noise mitigation measures should be applied where exceedances of the NMLs are predicted. Construction noise mitigation and management measures are discussed in **Section 6.1**.

5.2 Construction Road Traffic

The Proposal is expected to require up to 50 heavy vehicle trips per day during peak demolition works periods, and an estimated average of 25 heavy vehicle trips per day.

For the duration of the project, construction traffic will enter the site via dedicated gates on the existing driveway from Bank St, acting as the primary construction access and egress point for demolition with dedicated construction routes to use the arterial road network as much as possible.

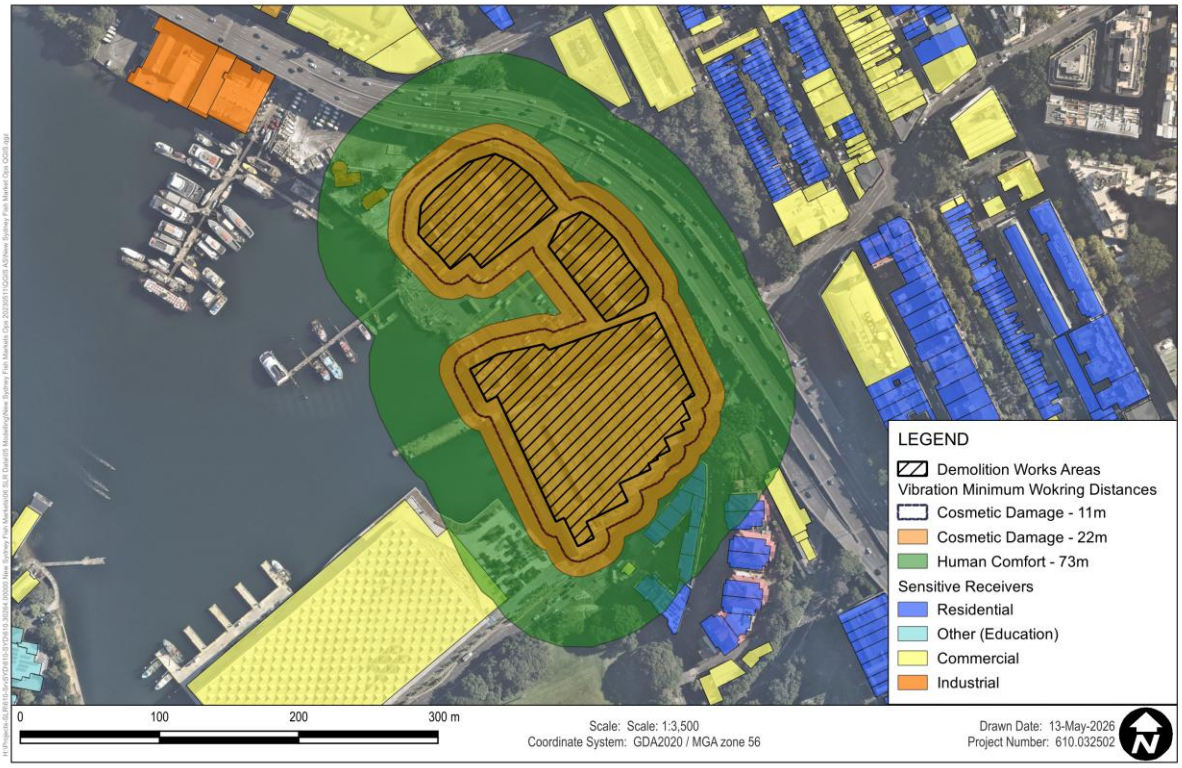
The relatively small number of construction vehicles is not expected to have a significant effect on existing road traffic noise levels in the study area and therefore is not anticipated to exceed the criteria.

5.3 Construction Vibration

The major potential sources of vibration from the proposed construction activities would likely be during W.002 - 'Site Demolition Works' and W.004 - 'Southern Façade Demolition' when large hydraulic hammers and jackhammers are being used.

Vibration offset distances have been determined from the TfNSW CNVG minimum working distances for cosmetic damage and human comfort (see **Table 10** and **Section 3.2**) and the assessment is summarised in **Figure 3**. As large hydraulic hammers and jackhammers have the potential to be used in the same areas, the offset distances presented in **Figure 3** have been conservatively developed for the higher vibration intensive large hydraulic hammer and are representative of the highest vibration levels that would likely be experienced by the nearest receivers when work occurs nearby.

Figure 3 Construction Vibration Minimum Working Distances – Large Hydraulic Hammer



5.3.1.1 Cosmetic Damage

Figure 3 shows that all nearby sensitive receivers are outside the minimum working distance for cosmetic damage. Therefore, cosmetic damage impacts are not considered likely.

All appropriate feasible and reasonable construction vibration mitigation measures should still be applied. Mitigation and management measures are discussed in **Section 6.0**.

5.3.1.2 Human Comfort

Figure 3 identifies that the nearest residential and commercial receivers to the south and west of the site are within the human comfort minimum working distance. Occupants of affected buildings may be able to perceive vibration impacts at times when vibration intensive equipment is in use. Where impacts are perceptible, they would likely only be apparent for relatively short durations when vibration intensive equipment is nearby.

Mitigation and management measures are discussed in **Section 6.0**.

6.0 Mitigation and Management Measures

6.1 Construction Noise Impacts

The construction noise and vibration predictions indicate that the proposed construction activities are likely to exceed the construction noise management levels at certain locations adjacent to the work areas, during certain activities.

6.1.1 Standard Mitigation Measures

Where impacts above the NMLs are predicted, feasible and reasonable noise mitigation and management strategies could be implemented to minimise noise impacts. The ICNG and CNVG-PTI provide guidance on feasible and reasonable work practices and strategies to minimise noise impacts for construction works. Standard mitigation measures which may be considered appropriate for the Proposal, as taken from the CNVG-PTI, are shown in **Table 14**.

Table 14 CNVG Standard Mitigation and Management Measures

Action Required	Applies To	Details
Management measures		
Implementation of any project specific mitigation measures required.	Airborne noise	Implementation of any project specific mitigation measures required.
Implement community consultation or notification measures.	Airborne noise Ground-borne noise & vibration	Notification detailing work activities, dates and hours, impacts and mitigation measures, indication of work schedule over the night-time period, any operational noise benefits from the works (where applicable) and contact telephone number. Notification should be a minimum of 7 calendar days prior to the start of works. For projects other than maintenance works more advanced consultation or notification may be required. Please contact Roads and Maritime Communication and Stakeholder Engagement for guidance. Website (If required) Contact telephone number for community Email distribution list (if required) Community drop-in session (if required by approval conditions).
Site inductions	Airborne noise Ground-borne noise & vibration	All employees, contractors and subcontractors are to receive an environmental induction. The induction must at least include: • all project specific and relevant standard noise and vibration mitigation measures • relevant licence and approval conditions • permissible hours of work • any limitations on high noise generating activities • location of nearest sensitive receivers • construction employee parking areas • designated loading/unloading areas and procedures • site opening/closing times (including deliveries) • environmental incident procedures.

Action Required	Applies To	Details
Behavioural practices	Airborne noise	No swearing or unnecessary shouting or loud stereos/radios on site. No dropping of materials from height, throwing of metal items and slamming of doors.
Verification	Airborne noise Ground-borne noise & vibration	Where specified under **Appendix C** of the CNVG a noise verification program is to be carried out for the duration of the works in accordance with the Construction Noise and Vibration Management Plan and any approval and licence conditions.
Attended vibration measurements	Ground-borne vibration	Where required attended vibration measurements should be undertaken at the commencement of vibration generating activities to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.
Update Construction Environmental Management Plans	Airborne noise Ground-borne noise & vibration	The CEMP must be regularly updated to account for changes in noise and vibration management issues and strategies.
Building condition surveys	Vibration Blasting	Undertake building dilapidation surveys on all buildings located within the buffer zone prior to commencement of activities with the potential to cause property damage
Source controls		
Construction hours and scheduling	Airborne noise Ground-borne noise & vibration	Where feasible and reasonable, construction should be carried out during the standard daytime working hours. Work generating high noise and/or vibration levels should be scheduled during less sensitive time periods.
Construction respite period during normal hours and out-of-hours work	Ground-borne noise & vibration Airborne noise	See **Appendix C** of the CNVG for more details on the following respite measures: • Respite Offers (RO) • Respite Period 1 (R1) • Respite Period 2 (R2) • Duration Respite (DR)
Equipment selection.	Airborne noise Ground-borne noise & vibration	Use quieter and less vibration emitting construction methods where feasible and reasonable. For example, when piling is required, bored piles rather than impact-driven piles will minimise noise and vibration impacts. Similarly, diaphragm wall construction techniques, in lieu of sheet piling, will have significant noise and vibration benefits. Ensure plant including the silencer is well maintained.
Plant noise levels.	Airborne-noise	The noise levels of plant and equipment must have operating Sound Power or Sound Pressure Levels compliant with the criteria in Appendix H of the CNVG. Implement a noise monitoring audit program to ensure equipment remains within the more stringent of the manufacturers specifications or Appendix H of the CNVG.
Rental plant and equipment.	Airborne-noise	The noise levels of plant and equipment items are to be considered in rental decisions and in any case cannot be used on site unless compliant with the criteria in Table 2 of the CNVG.
Use and siting of plant.	Airborne-noise	The offset distance between noisy plant and adjacent sensitive receivers is to be maximised. Plant used intermittently to be throttled down or shut down. Noise-emitting plant to be directed away from sensitive receivers. Only have necessary equipment on site.

Action Required	Applies To	Details
Plan worksites and activities to minimise noise and vibration.	Airborne noise Ground-borne vibration	Locate compounds away from sensitive receivers and discourage access from local roads. Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site. Where additional activities or plant may only result in a marginal noise increase and speed up works, consider limiting duration of impact by concentrating noisy activities at one location and move to another as quickly as possible. Very noise activities should be scheduled for normal working hours. If the work can not be undertaken during the day, it should be completed before 11:00pm. Where practicable, work should be scheduled to avoid major student examination periods when students are studying for examinations such as before or during Higher School Certificate and at the end of higher education semesters. If programmed night work is postponed the work should be re-programmed and the approaches in this guideline apply again.
Reduced equipment power	Airborne noise Ground-borne vibration	Use only the necessary size and power.
Non-tonal and ambient sensitive reversing alarms	Airborne noise	Non-tonal reversing beepers (or an equivalent mechanism) must be fitted and used on all construction vehicles and mobile plant regularly used on site and for any out of hours work. Consider the use of ambient sensitive alarms that adjust output relative to the ambient noise level.
Minimise disturbance arising from delivery of goods to construction sites.	Airborne noise	Loading and unloading of materials/deliveries is to occur as far as possible from sensitive receivers. Select site access points and roads as far as possible away from sensitive receivers. Dedicated loading/unloading areas to be shielded if close to sensitive receivers. Delivery vehicles to be fitted with straps rather than chains for unloading, wherever possible. Avoid or minimise these out of hours movements where possible.
Engine compression brakes	Construction vehicles	Limit the use of engine compression brakes at night and in residential areas. Ensure vehicles are fitted with a maintained Original Equipment Manufacturer exhaust silencer or a silencer that complies with the National Transport Commission's 'In-service test procedure' and standard.
Path controls		
Shield stationary noise sources such as pumps, compressors, fans etc.	Airborne noise	Stationary noise sources should be enclosed or shielded where feasible and reasonable whilst ensuring that the occupational health and safety of workers is maintained. **Appendix D** of AS 2436:2010 lists materials suitable for shielding.
Shield sensitive receivers from noisy activities.	Airborne noise	Use structures to shield residential receivers from noise such as site shed placement; earth bunds; fencing; erection of operational stage noise barriers (where practicable) and consideration of site topography when situating plant.

Action Required	Applies To	Details
Receptor control		
Structural surveys and vibration monitoring	Ground-borne vibration	Pre-construction surveys of the structural integrity of vibration sensitive buildings may be warranted. At locations where there are high-risk receptors, vibration monitoring should be conducted during the activities causing vibration.
See **Appendix C** of the CNVG for additional measures	Airborne noise Ground-borne vibration	In some instances, additional mitigation measures may be required.

Where residual impacts still exist once standard mitigation and management measures are implemented, additional site-specific measures may also be recommended.

6.1.2 Additional Noise Mitigation Measures

The Transport CNVG-PTI requires additional noise mitigation measures to be considered where exceedances of the noise goals are predicted, particularly during Out of Hours Works (OOHWs).

The Transport CNVG-PTI additional mitigation measures are listed in **Table 15** and described in **Table 14**. The additional mitigation measures matrix (AMMM) for construction noise is reproduced in **Table 16**.

The objective of these additional noise mitigation measures is to engage, inform and provide project-specific messages to the community, recognising that advanced warning of potential disruptions can assist in reducing the impact.

Table 15 Additional Mitigation Measures

Mitigation / Management Measure	Abbreviation
Periodic Notification	PN
Verification Monitoring	V
Specific Notification	SN
Respite Offer	RO
Alternative Accommodation	AA
Alternative Construction Methodology	AC
Respite Period	RP
Duration Respite	DR

Table 16 Transport CNVG-PTI Additional Mitigation Measures Matrix – Airborne Construction Noise

Construction Hours	Receiver Perception	dBA above RBL	dBA above NML	Additional Management Measures[3]
Standard Hours Mon-Fri (7am - 6pm) Sat (8am - 1pm) Sun/Pub Hol (Nil)	Noticeable	5 to 10	0	-
	Clearly Audible	>10 to 20	≤10	-
	Moderately Intrusive	>20 to 30	>10 to 20	PN, V
	Highly Intrusive	>30	>20	PN, V
	75 dBA or greater	N/A	N/A	PN, V, SN
OOHW Period 1 Mon-Fri (6pm - 10pm) Sat (7am - 8am & 1pm - 10pm) Sun/Pub Hol. (8am - 6pm)	Noticeable	5 to 10	≤5	-
	Clearly Audible	>10 to 20	5 to 15	PN, RP[1], DR[1]
	Moderately Intrusive	>20 to 30	>15 to 25	PN, V, SN, RO, RP[1], DR[1]
	Highly Intrusive	>30	>25	PN, V, SN, RO, RP[1], DR[1]
OOHW Period 2 Mon-Sat (12am - 7am & 10pm - 12am) Sun/Pub Hol. (12am - 8am & 6pm - 12am)	Noticeable	5 to 10	≤5	PN
	Clearly Audible	>10 to 20	5 to 15	PN, V, SN, RO[2], RP[1], DR[1]
	Moderately Intrusive	>20 to 30	>15 to 25	PN, V, SN, RO[2], RP[1], DR[1]
	Highly Intrusive	>30	>25	PN, V, SN, RO[2], RP[1], DR[1], AA

Note 1: Respite periods and duration reduction are not applicable when works are carried out during OOHW Period 1 Day only (ie Saturday 6am-7am and 1pm-6pm, Sunday / Public Holidays 8am-6pm).

Note 2: Respite offer during OOHW Period 2 are only applicable for evening periods (ie, Sundays / Public Holidays 6pm-10pm), and may not be required if a respite offer has already been made for the immediately preceding OOHW Period 1.

Note 3: PN = Project notification, SN = Specific notification, individual briefings, or phone call, V = Verification monitoring, DR = Duration Reduction, RP = Respite Period, RO = Project specific respite offer, AA = Alternative accommodation.

6.1.3 Additional Vibration Mitigation Measures

Where the vibration management levels for building damage may be exceeded, vibration monitoring should be conducted to determine site specific minimum working distances.

Alternative construction methodologies may need to be considered where it is not possible to complete the work within the building damage vibration management levels. The additional mitigation measures described in the Transport CNVG-PTI are summarised below in **Table 17**.

Table 17 Additional Mitigation Measures Matrix – Construction Vibration

Construction hours	Receiver Perception	Vibration Management Level	Additional Management Measures
Standard Hours Mon-Fri (7am - 6pm) Sat (8am - 1pm) Sun/Pub Hol (Nil)	Human disturbance	Exceeds HVML	PN, V, RO
	Building damage	Exceeds DVML	V, AC
OOHW Period 1 Mon-Fri (6pm - 10pm) Sat (7am - 8am) & (1pm - 10pm) Sun/Pub Hol. (8am - 6pm)	Human disturbance	Exceeds HVML	PN, V, SN, RO, RP, DR
	Building damage	Exceeds DVML	V, AC
OOHW Period 2 Mon-Fri (10pm - 7am) Sat (10pm - 8am) Sun/Pub Hol. (6pm - 7am)	Human disturbance	Exceeds HVML	PN, V, SN, RO, AA, RP, DR
	Building damage	Exceeds DVML	V, AC

Notes: PN = Project notification SN = Specific notification, individual briefings, or phone call, V = Verification monitoring, AA = Alternative accommodation, DR = Duration Reduction, RO = Project specific respite offer, RP = Respite Period, AC = Alternative construction methodology, HVML = vibration management level for human disturbance, DVML = vibration management level for cosmetic damage to buildings or structures.

6.1.4 Project Specific Mitigation Measures

The following project specific mitigation measures have been adopted or are recommended:

- A Construction Noise and Vibration Management Plan should be produced for the proposal one construction methodologies are confirmed. This should include:
  - description of works, construction equipment and hours of work
  - criteria for the project and relevant licence and approval conditions
  - requirements for noise and vibration monitoring
  - details of how community consultation would be completed and procedures for handling complaints
  - details on how respite would be applied where ongoing high impacts are seen at certain receivers.
- The demolition methodology has been designed to stage works from north to south, with the southern façade of the former fish markets building retained during the main demolition phase. This staging approach allows for use of the southern wall as a noise mitigation measure, thus acting as a temporary noise barrier for the main site demolition works, particularly to the closest residential receivers to the south. The proposal should endeavour to maintain the southern wall for as long as practicable throughout the demolition works.
- The assessment has identified that relatively high impacts are likely when noise intensive equipment such as large hydraulic hammers, jackhammers and concrete saws are in use. Residential receivers near to the work are predicted to have 'moderately intrusive' worst-case impacts in NCA03 and are also predicted to experience highly noise affected levels (75 dBA or greater) during highly noise intensive site demolition works. As outlined in **Table 3**, where noise is above this level, the relevant authority may require respite periods by restructuring the hours that the very noisy activities can occur, such as before and after school for works near schools or mid-morning or mid-afternoon for works near residences. These measures would be confirmed during the development of the Construction Noise and Vibration Management Plan or as the demolition progresses.

7.0 Conclusion

SLR has been engaged to assess the potential construction noise impacts from the proposed demolition of the former Sydney Fish Market buildings.

The nearest residential receivers to the proposal are predicted to be subject to ‘moderately intrusive’ or ‘clearly audible’ worst-case noise impacts at certain times, particularly when noise intensive equipment such as large hydraulic hammers, jackhammers or concrete saws are used in close proximity. Receivers south of the site in NCA03 (R12 and R14) are also predicted to experience highly noise affected levels (75 dBA or greater) during these noise intensive activities. Residential receivers which are further back are also predicted to be impacted by the Proposal during noisy construction work, but to a lesser degree.

The main potential source of vibration during construction of the proposal would be from large hydraulic hammers and jackhammers. The nearest receivers to the proposal are likely to be outside of the minimum working distances for cosmetic damage, but within the minimum working distances for human comfort.

The Proposal should apply all feasible and reasonable work practices to reduce the potential noise and vibration impacts and a number of strategies have been recommended. The exact strategies would be determined during development of a Construction Noise and Vibration Management Plan prior to construction work commencing.

The noise and vibration impacts attributed to the proposal can be managed through the methodology and recommended mitigation measures outlined in **Section 6.0** of this report.

Appendix A Acoustic Terminology

Former Sydney Fish Markets Demolition

Construction Noise and Vibration Impact Assessment

Infrastructure NSW

SLR Project No.: 610.032502.00001

22 May 2026

1. Sound Level or Noise Level

The terms 'sound' and 'noise' are almost interchangeable, except that 'noise' often refers to unwanted sound.

Sound (or noise) consists of minute fluctuations in atmospheric pressure. The human ear responds to changes in sound pressure over a very wide range with the loudest sound pressure to which the human ear can respond being ten million times greater than the softest. The decibel (abbreviated as dB) scale reduces this ratio to a more manageable size by the use of logarithms.

The symbols SPL, L or LP are commonly used to represent Sound Pressure Level. The symbol LA represents A-weighted Sound Pressure Level. The standard reference unit for Sound Pressure Levels expressed in decibels is 2 x 10-5 Pa.

2. 'A' Weighted Sound Pressure Level

The overall level of a sound is usually expressed in terms of dBA, which is measured using a sound level meter with an 'A-weighting' filter. This is an electronic filter having a frequency response corresponding approximately to that of human hearing. People's hearing is most sensitive to sounds at mid frequencies (500 Hz to 4,000 Hz), and less sensitive at lower and higher frequencies. Different sources having the same dBA level generally sound about equally loud.

A change of 1 dB or 2 dB in the level of a sound is difficult for most people to detect, whilst a 3 dB to 5 dB change corresponds to a small but noticeable change in loudness. A 10 dB change corresponds to an approximate doubling or halving in loudness. The table below lists examples of typical noise levels.

Sound Pressure Level (dBA)	Typical Source	Subjective Evaluation
130	Threshold of pain	Intolerable
120	Heavy rock concert	Extremely noisy
110	Grinding on steel	
100	Loud car horn at 3 m	Very noisy
90	Construction site with pneumatic hammering	
80	Kerbside of busy street	Loud
70	Loud radio or television	
60	Department store	Moderate to quiet
50	General Office	
40	Inside private office	Quiet to very quiet
30	Inside bedroom	
20	Recording studio	Almost silent

5. Frequency Analysis

Other weightings (eg B, C and D) are less commonly used than A-weighting. Sound Levels measured without any weighting are referred to as 'linear', and the units are expressed as dB(lin) or dB.

3. Sound Power Level

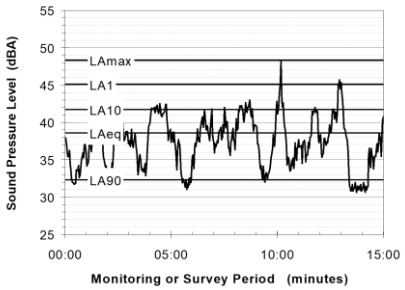
The Sound Power of a source is the rate at which it emits acoustic energy. As with Sound Pressure Levels, Sound Power Levels are expressed in decibel units (dB or dBA), but may be identified by the symbols SWL or LW, or by the reference unit 10^{-12} W.

The relationship between Sound Power and Sound Pressure is similar to the effect of an electric radiator, which is characterised by a power rating but has an effect on the surrounding environment that can be measured in terms of a different parameter, temperature.

4. Statistical Noise Levels

Sounds that vary in level over time, such as road traffic noise and most community noise, are commonly described in terms of the statistical exceedance levels L_{AN}, where L_{AN} is the A-weighted sound pressure level exceeded for N% of a given measurement period. For example, the L_{A1} is the noise level exceeded for 1% of the time, L_{A10} the noise exceeded for 10% of the time, and so on.

The following figure presents a hypothetical 15 minute noise survey, illustrating various common statistical indices of interest.



Of particular relevance, are:

L_{A1} The noise level exceeded for 1% of the 15 minute interval.

L_{A10} The noise level exceeded for 10% of the 15 minute interval. This is commonly referred to as the average maximum noise level.

L_{A90} The noise level exceeded for 90% of the sample period. This noise level is described as the average minimum background sound level (in the absence of the source under consideration), or simply the background level.

L_{Aeq} The A-weighted equivalent noise level (basically, the average noise level). It is defined as the steady sound level that contains the same amount of acoustical energy as the corresponding time-varying sound.

7. Vibration

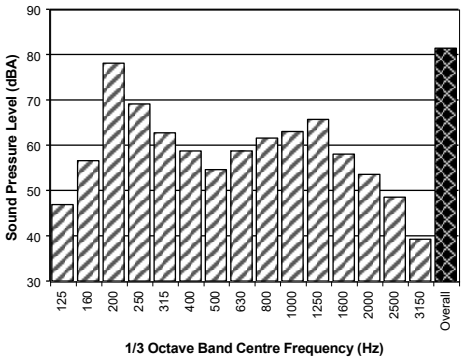
Frequency analysis is the process used to examine the tones (or frequency components) which make up the overall noise or vibration signal.

The units for frequency are Hertz (Hz), which represent the number of cycles per second.

Frequency analysis can be in:

- Octave bands (where the centre frequency and width of each band is double the previous band)
- 1/3 octave bands (three bands in each octave band)
- Narrow band (where the spectrum is divided into 400 or more bands of equal width)

The following figure shows a 1/3 octave band frequency analysis where the noise is dominated by the 200 Hz band. Note that the indicated level of each individual band is less than the overall level, which is the logarithmic sum of the bands.



6. Annoying Noise (Special Audible Characteristics)

A louder noise will generally be more annoying to nearby receivers than a quieter one. However, noise is often also found to be more annoying and result in larger impacts where the following characteristics are apparent:

- Tonality - tonal noise contains one or more prominent tones (ie differences in distinct frequency components between adjoining octave or 1/3 octave bands), and is normally regarded as more annoying than 'broad band' noise.
- Impulsiveness - an impulsive noise is characterised by one or more short sharp peaks in the time domain, such as occurs during hammering.
- Intermittency - intermittent noise varies in level with the change in level being clearly audible. An example would include mechanical plant cycling on and off.
- Low Frequency Noise - low frequency noise contains significant energy in the lower frequency bands, which are typically taken to be in the 10 to 160 Hz region.

Vibration may be defined as cyclic or transient motion. This motion can be measured in terms of its displacement, velocity or acceleration. Most assessments of human response to vibration or the risk of damage to buildings use measurements of vibration velocity. These may be expressed in terms of 'peak' velocity or 'rms' velocity.

The former is the maximum instantaneous velocity, without any averaging, and is sometimes referred to as 'peak particle velocity', or PPV. The latter incorporates 'root mean squared' averaging over some defined time period.

Vibration measurements may be carried out in a single axis or alternatively as triaxial measurements (ie vertical, longitudinal and transverse).

The common units for velocity are millimetres per second (mm/s). As with noise, decibel units can also be used, in which case the reference level should always be stated. A vibration level V, expressed in mm/s can be converted to decibels by the formula 20 log (V/Vo), where Vo is the reference level (10-9 m/s). Care is required in this regard, as other reference levels may be used.

8. Human Perception of Vibration

People are able to 'feel' vibration at levels lower than those required to cause even superficial damage to the most susceptible classes of building (even though they may not be disturbed by the motion). An individual's perception of motion or response to vibration depends very strongly on previous experience and expectations, and on other connotations associated with the perceived source of the vibration. For example, the vibration that a person responds to as 'normal' in a car, bus or train is considerably higher than what is perceived as 'normal' in a shop, office or dwelling.

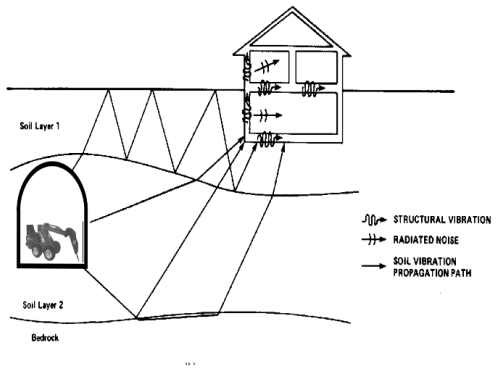
9. Ground-borne Noise, Structure-borne Noise and Regenerated Noise

Noise that propagates through a structure as vibration and is radiated by vibrating wall and floor surfaces is termed 'structure-borne noise', 'ground-borne noise' or 'regenerated noise'. This noise originates as vibration and propagates between the source and receiver through the ground and/or building structural elements, rather than through the air.

Typical sources of ground-borne or structure-borne noise include tunnelling works, underground railways, excavation plant (eg rockbreakers), and building services plant (eg fans, compressors and generators).

The following figure presents an example of the various paths by which vibration and ground-

borne noise may be transmitted between a source and receiver for construction activities occurring within a tunnel.



The term ‘regenerated noise’ is also used in other instances where energy is converted to noise away from the primary source. One example would be a fan blowing air through a discharge grill. The fan is the energy source and primary noise source. Additional noise may be created by the aerodynamic effect of the discharge grill in the airstream. This secondary noise is referred to as regenerated noise.

Appendix B Construction Noise Sources

Former Sydney Fish Markets Demolition

Construction Noise and Vibration Impact Assessment

Infrastructure NSW

SLR Project No.: 610.032502.00001

22 May 2026

Equipment		Total Lw (dBA)	Crane - Mobile	Elevated Work Platform	Excavator - Tracked (30 tonne)	Excavator 20-30T + Hammer	Front End Loader	Hand tools (electric)	Jackhammer	Light Vehicles	Loader – (Skidsteer)	Rattle Gun	Saw - Concrete	Truck - Dump	Truck - Medium Rigid (20T)	Truck - Truck & Dog	Truck – Articulated Low Loader
Sound Power Level (Lw)			113	97	110	122	113	102	113	95	110	104	118	110	103	108	107
Estimated utilisation in assessment period (%)			30%	25%	50%	30%	50%	75%	30%	25%	50%	30%	25%	25%	25%	25%	25%
ID	**Construction Scenario**																
W.001	Site Establishment and Preparation Works	**114**	2	3				5		5		1			2		2
W.002	Site Demolition Works – Highly Noise Intensive	**124**	1	3	2	3	1	5	2	10	2		2	1	3	2	
W.003	Site Demolition Works – Typical	**117**	1	3	2		1	5		10	2			2	3	2	
W.004	Southern Wall Demolition – Highly Noise Intensive	**120**	1	3	2	1		5	1	10	1		1		2	2	
W.005	Southern Wall Demolition – Typical	**116**	1	3	2			5		10	1				2	2	
W.006	Site Clearing Works	**112**	1					4		1		1			1	1	1

Appendix C Construction Noise Contours

Former Sydney Fish Markets Demolition

Construction Noise and Vibration Impact Assessment

Infrastructure NSW

SLR Project No.: 610.032502.00001

22 May 2026

Figure 4 W.001 Site Establishment and Preparation Works

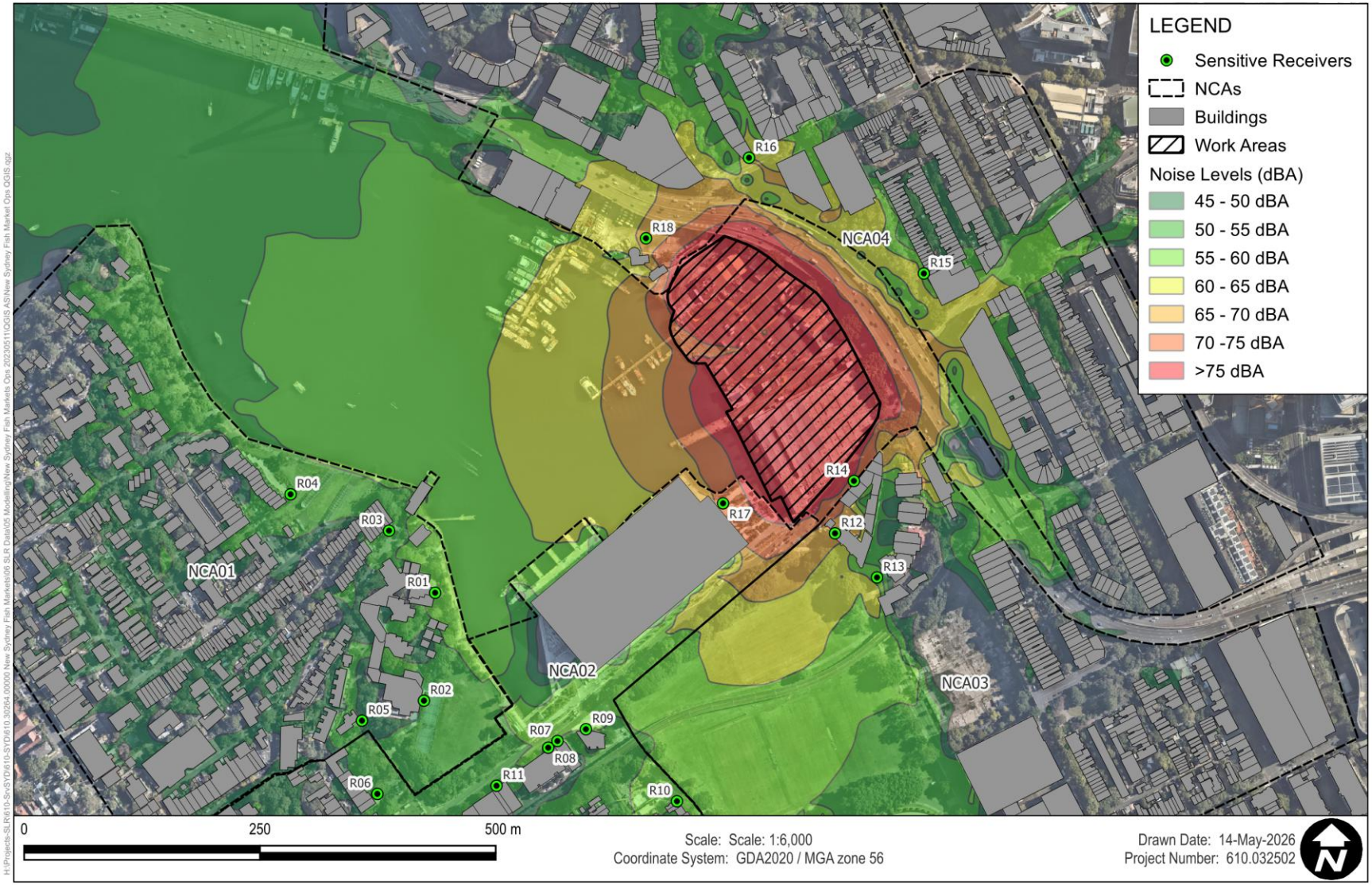


Figure 5 W.002 Site Demolition Works – Highly Noise Intensive

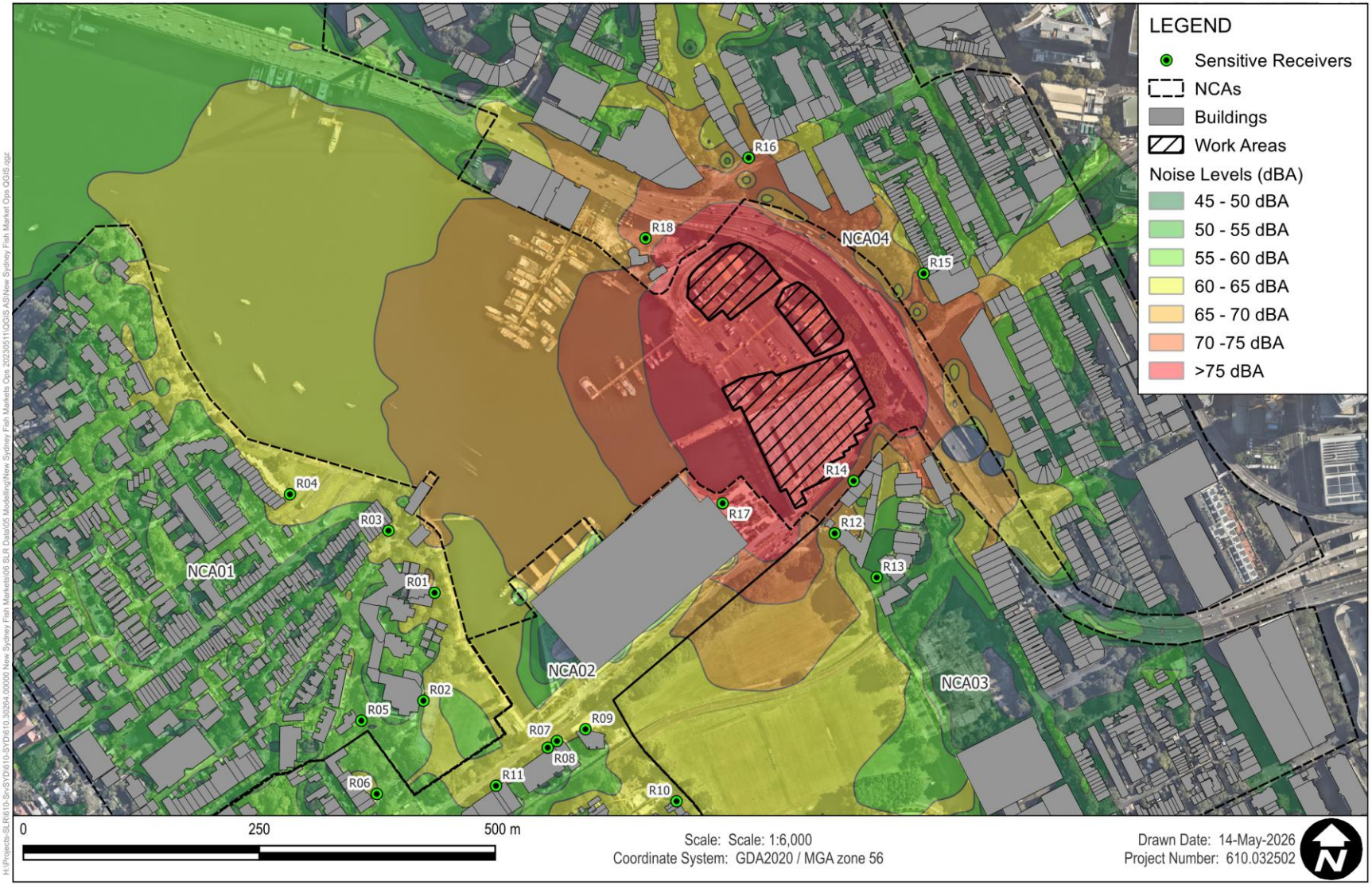


Figure 6 W.003 Site Demolition Works – Typical

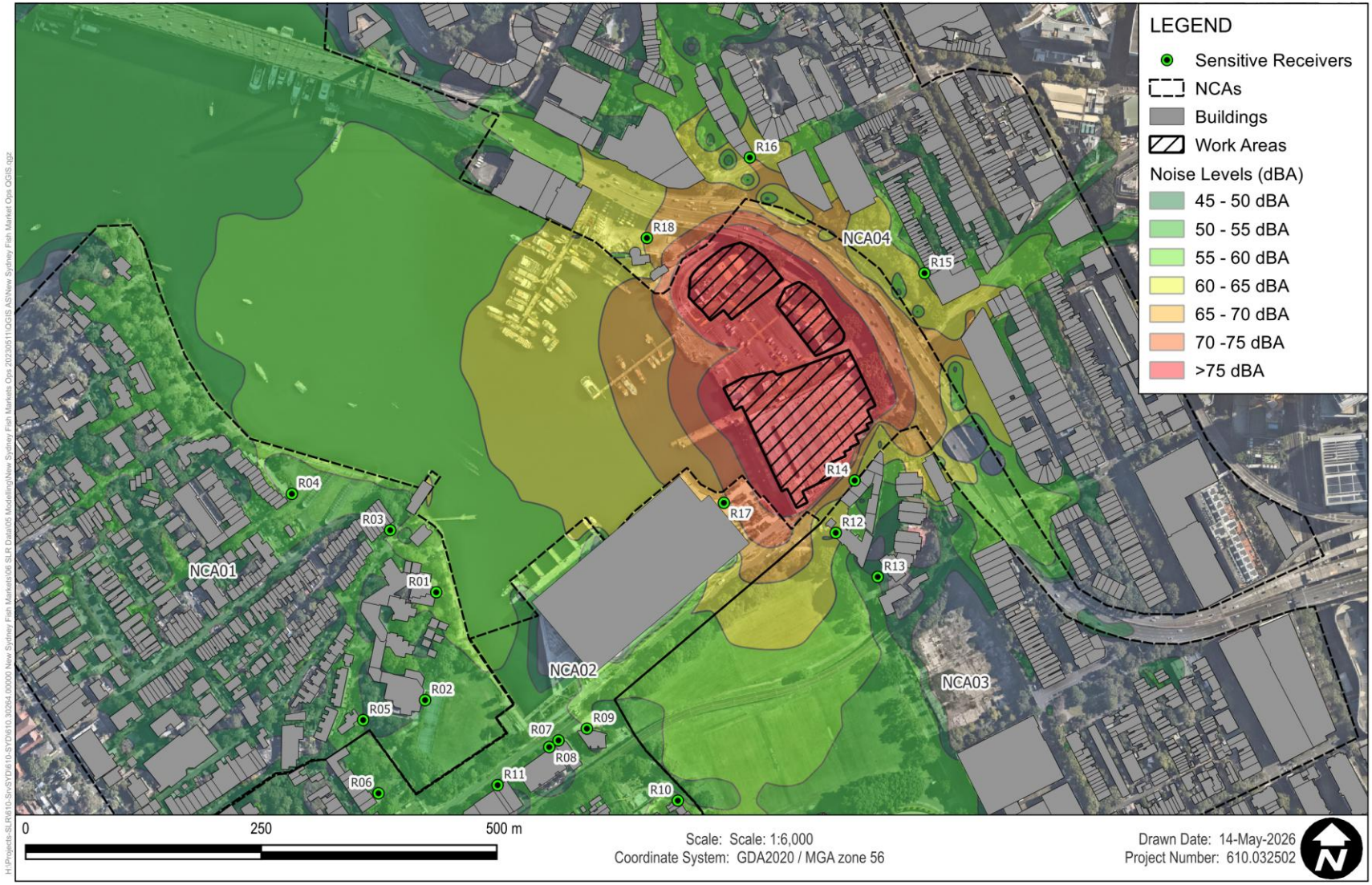


Figure 7 W.004 Southern Wall Demolition – Highly Noise Intensive

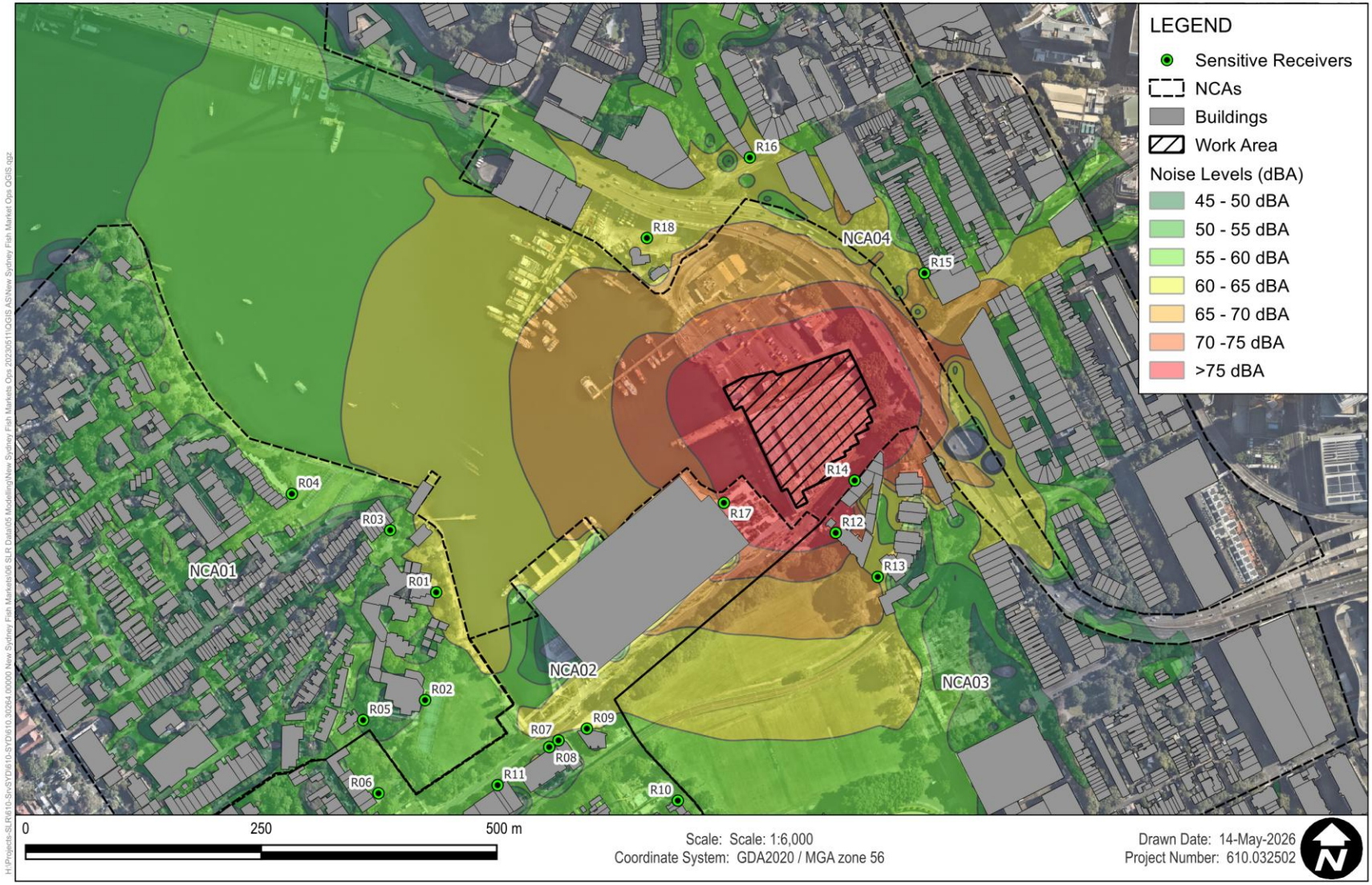


Figure 8 W.005 Southern Wall Demolition – Typical

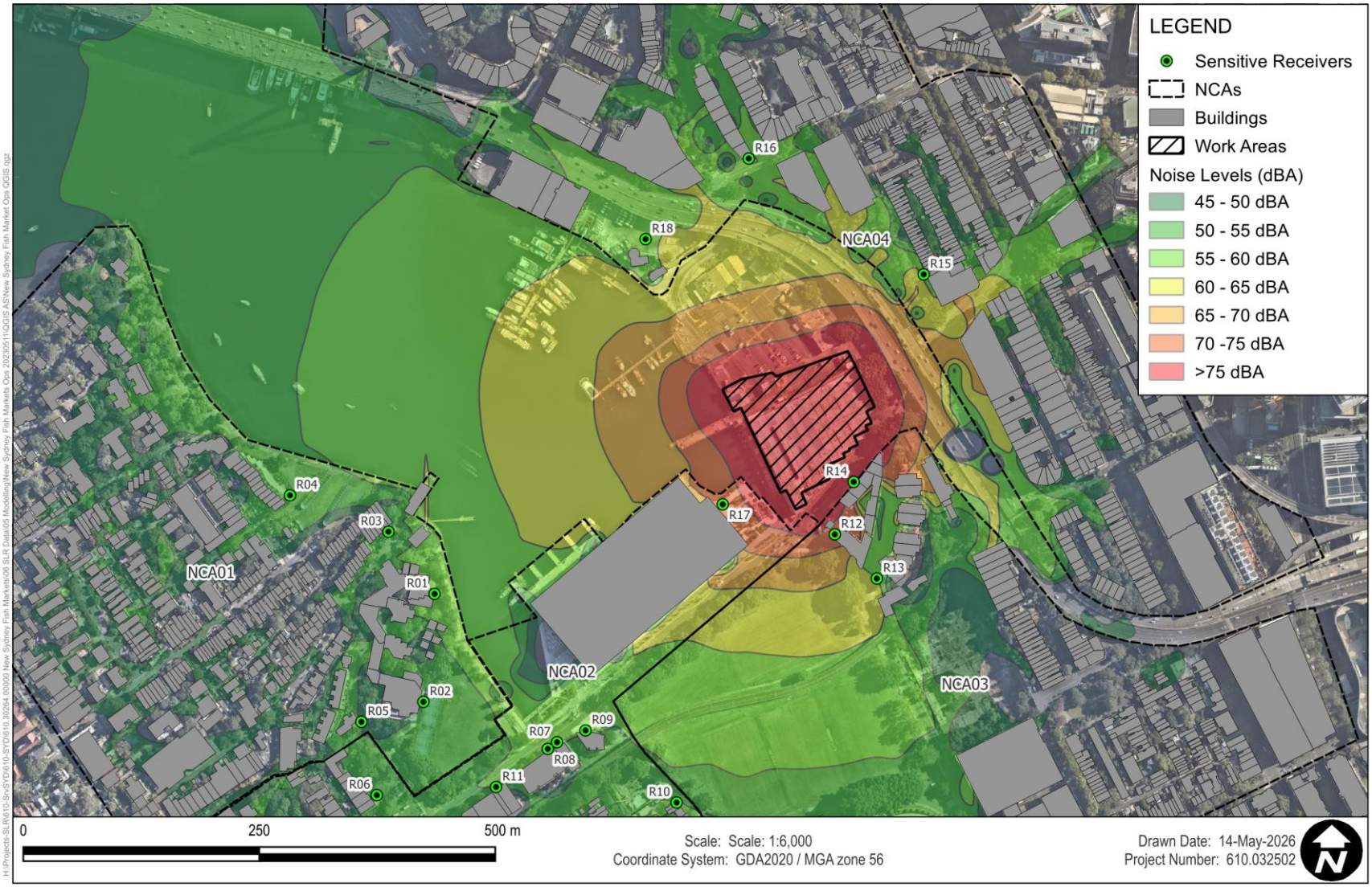
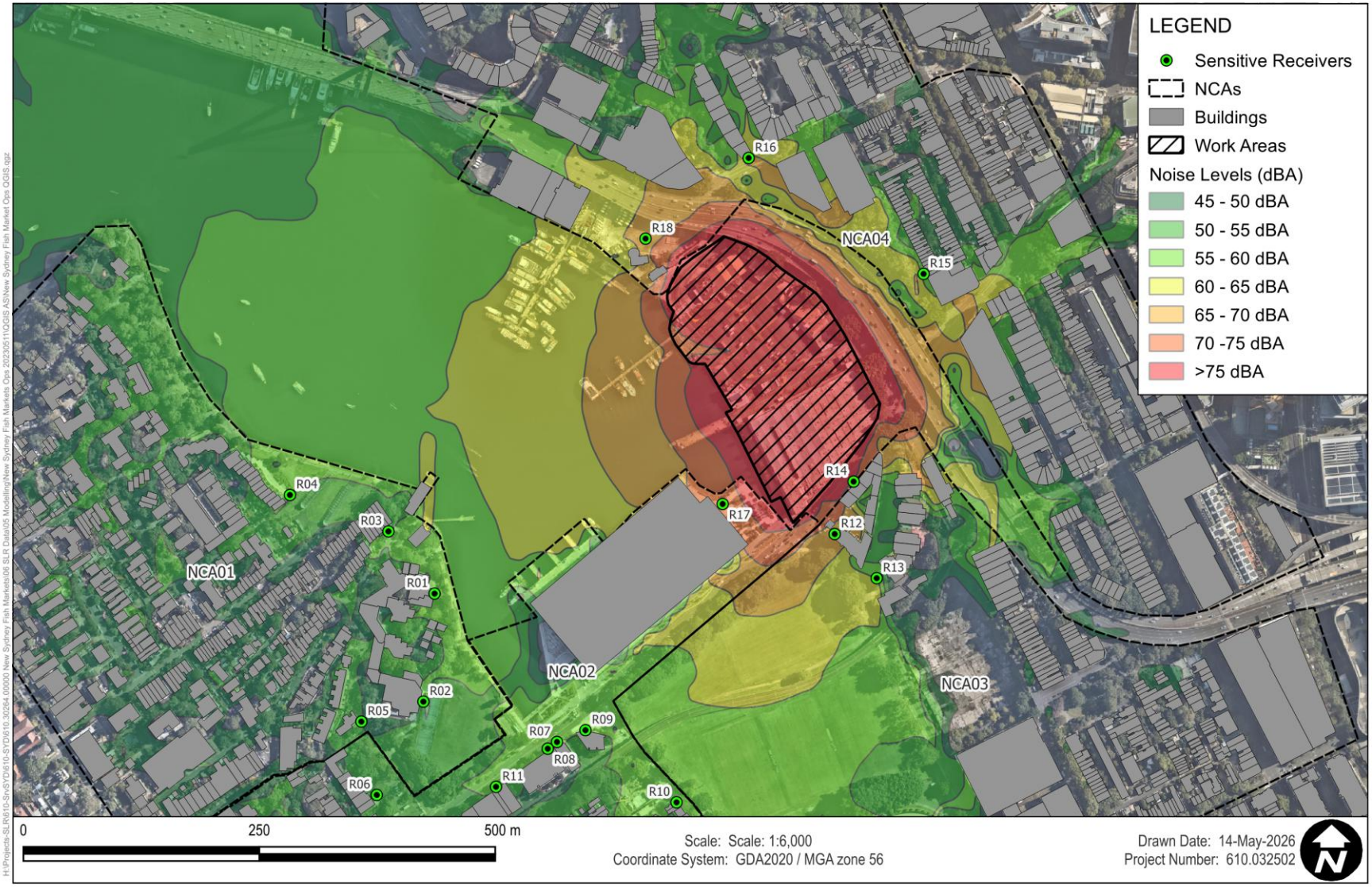
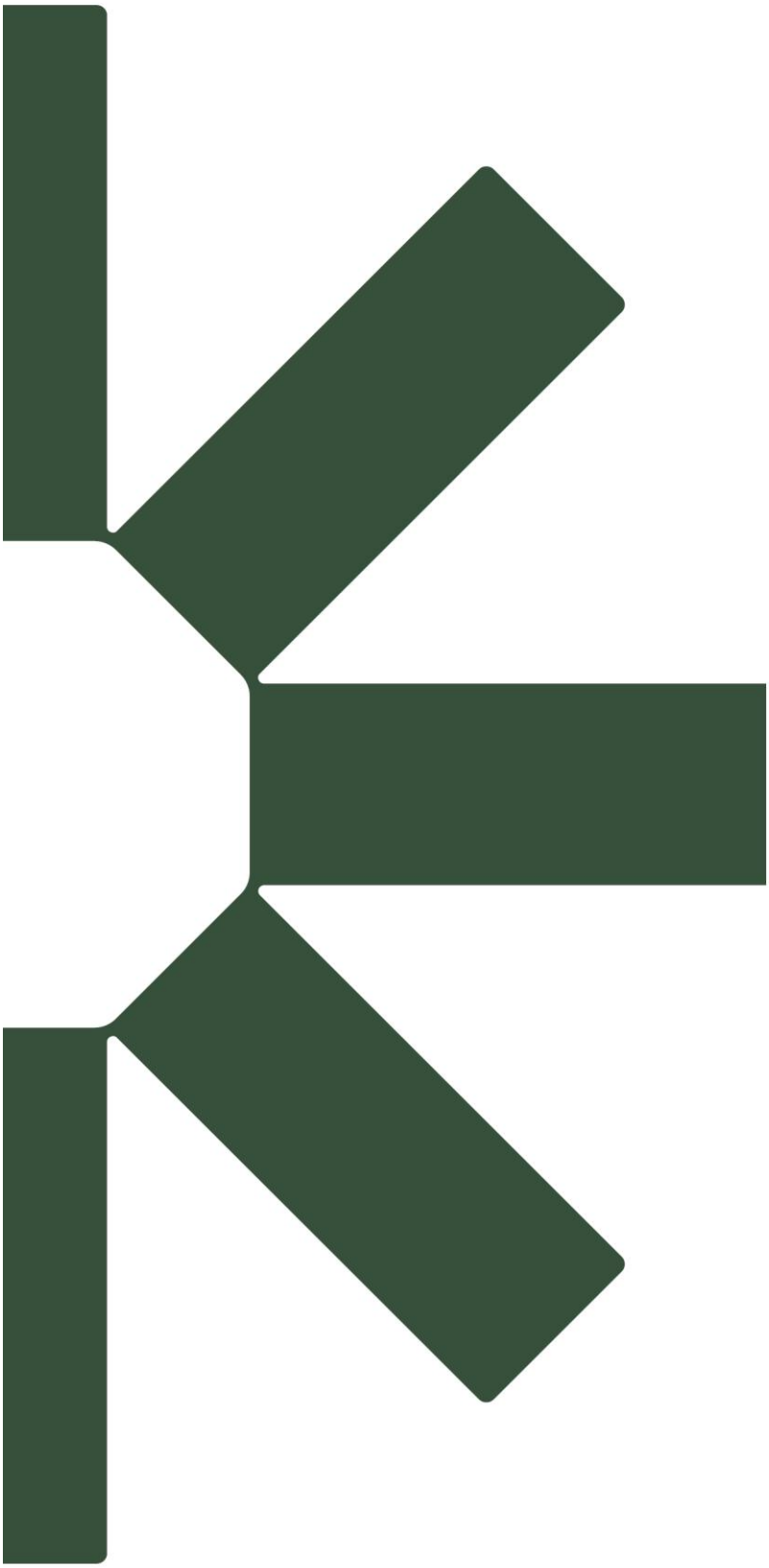


Figure 9 W.006 Site Clearing Works





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